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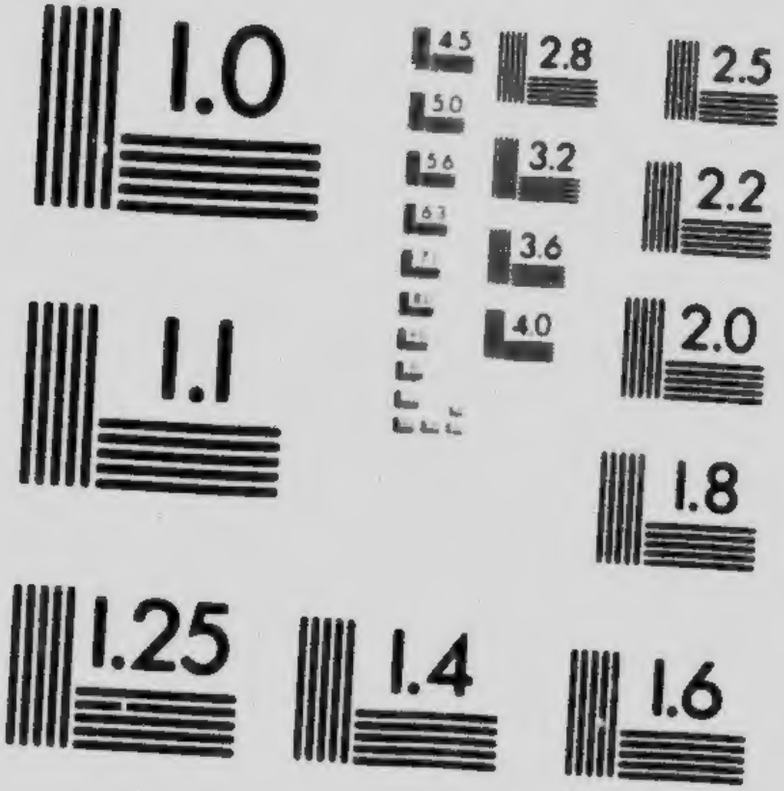

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Manitoba Agricultural College

Winnipeg · · Canada

PERENNIAL SOW THISTLE

Twelve Noxious Weeds

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INTRODUCTION

It is now quite generally granted that the control and destruction of weeds is one of the most important problems confronting the Western farmer. The fertility of the Western soil ensures a good crop of weeds, and if for any reason they get ahead of the farm crop, loss is bound to result.

This loss is acknowledged in a general way, but since there is no easy and accurate way of computing it in dollars and cents for a particular crop, the matter is largely overlooked and a short crop accepted with the same resignation as if a hail-storm had been the cause.

The loss from smut was accepted, at one time, in the same way. Thanks to the onward march of progressive agriculture, the farmer who does not treat his grain for smut is almost unknown, and treatment is effective nine times out of ten.

Weeds cause more loss than smut ever did, and the seed [illegible] be as thoroughly "treated" for weeds as for smut. [illegible] seed" is the watchword, but sowing clean seed in a dirty [illegible] sents labor largely lost. The soil, too, must be treat- [illegible] treated thoroughly. In the third place, the crop must be treated, when such is possible, either by harrowing when weeds and grain are young, or by hand-pulling later when a new species makes its first appearance. An hour of hand-pulling at the right time will save hundreds in horse-power later.

The cleaning of the seed, the soil and the crop represent the viewpoint from which the writers have prepared this little bulletin in the hope that it may be a help, not only to those who are newcomers to the West, but also to those who have been waging war on the weeds for years with success, and who wish to continue the fight in the most economic way.

If your farm is over-run with weeds, in the first place don't get discouraged and do nothing, and in the next place don't attempt to clean them all out at once. Keep the general control as good as circumstances will permit, and clean up only as much as can be done thoroughly and promptly. Better summer-fallow fifty acres well, from a weed standpoint, than to treat one

hundred acres indifferently and at the wrong time. Half measures are not hopeless, but thoroughness always pays in the end.

The weeds dealt with on these pages are mostly old and well-established offenders. In case they may be new to some, we have added a few points and illustrations to aid in identification. Darnel, for instance, is not well known and for this reason is spreading rapidly.

We hope at some future time to make an addition to this list, including such weeds as are, like the old ones, getting a foothold before they are known.

We have preferred to deal with a small number in as brief a way as possible, and thus make reference more easy and the information more valuable. The remedies given are all tried, practical and suited to western conditions, but should be varied somewhat to suit different kinds of soil.

GENERAL PRINCIPLES

1. Weeds are of four kinds:—

(*a*) ANNUALS are those that grow from seed, produce seed and die in the same season; Wild Oats, for instance.

(*b*) WINTER ANNUALS germinate in the fall, live over winter and mature early in the following summer, on the same basis as Winter Wheat.

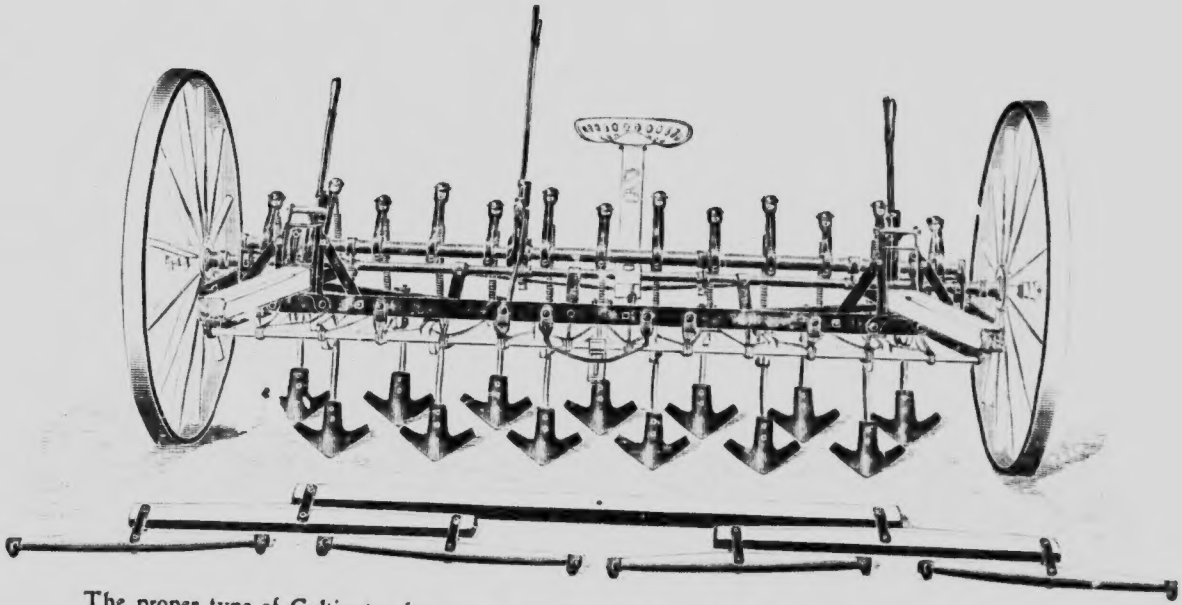
(*c*) BIENNIALS generally produce a thick root the first summer and flower and seed the second year, such as the Carrot or Evening Primrose.

(*d*) PERENNIALS grow from seed or cuttings and continue to produce seed for several years, although the top may die down each year, as in the Perennial Sow Thistle.

IMPLEMENTS

Unless a farmer is well supplied with suitable implements it is very difficult and costly to exterminate many of our noxious weeds. The following are some of the most useful of the recently introduced implements for weed destruction.

The Cultivator.—Properly manipulated, this is one of the most useful implements on the farm, especially in summer fallows. When fitted with narrow teeth, it is excellent for loosening up hard-packed soil and to bring to the surface the root-stocks of such perennials as Couch Grass and Thistles. Fitted with sharp, broad shares, it is even more useful in summer-fallows. It will then cut off both annual and perennial plants just below the surface of the ground and quickly clean the field. The shares should be sufficiently broad to overlap and be kept quite sharp, otherwise the weeds will be missed. This implement must be run crosswise of the ridges the first time, so as to cut all weeds in the dead furrows. The cultivator will not only kill all growing weeds in the summer-fallow, but will also encourage dormant weed seeds to germinate.



The proper type of Cultivator for eradicating Sow-thistle and other Weeds with underground stems.

The Weeders.—There are several forms of this useful implement, and all are excellent for killing weeds in the growing crop. The weeder should be started directly the weed seeds have germinated, and before the second pair of leaves has formed. The weeds are then readily displaced and killed, but the implement is of very little service after the weeds have a firm hold of the ground. If the weeder is kept free of stubble and other trash, there is very little danger of dragging out the grain, even after the crop is five or six inches high.

The Tilting Harrow.—This implement can be manipulated so as to serve a great many useful purposes on the farm. With the teeth set perpendicularly, it serves every purpose of the ordinary spike-toothed harrow. Having the teeth set well forward, the root-stocks of perennials can be torn out and quite large weeds destroyed. With the teeth set sloping backwards, even tender-rooted grain may be harrowed after it is above the surface without risk to the crop, and at the same time killing a large proportion of the weeds.

SUMMER FALLOW

One of the most effectual means of eradicating weeds in Western Canada, is by the practice of a thorough summer-fallow, more or less frequent, depending upon the prevailing conditions. There are several different systems of summer-fallowing in use in the West. In some instances the land is allowed to remain unplowed until all the weeds are fully grown and much of the weed seed formed if not actually ripe. When plowed under, a large proportion of these seeds will ripen and give trouble in future grain crops. Besides, the growing of such a heavy crop of weeds is a severe draft on the moisture of the soil: a point of great importance in this country.

WILD OATS
(*Avena fatua.*)

For the best results, summer-fallow should be plowed as early in June as it is possible to get the weed seeds to sprout in the land intended for fallow. The land should then be harrowed the same day as plowed, so as to retain moisture and stimulate additional weed seeds to germinate. Surface cultivation should be continued throughout the summer. The spike-toothed harrow will at first do good service in rooting out the young weeds, but after a time, when the soil becomes packed, it will be found necessary to use either the disc harrow or cultivator. It is not advisable to plow fallows a second time, as it brings weed seeds near the surface to lie until the following spring, when they start up among the crop and are then difficult to dispose of.

THE WILD OAT

(Avena fatua L.)

The Wild Oat, originally introduced from Europe, is still on the increase in Manitoba and the annual loss from this weed is enormous.

It is very difficult to distinguish the Wild Oat from the domestic oat before it heads out, but after the grain appears the panicle spreads much more rapidly and branches out more widely than any tame variety. It may thus be known by its loose, open head and the topmost grains will be found ripe, while the lower ones are still green. The awns are generally much longer and more prominent than in the cultivated oat.

The Wild Oat grain may be known by the following characters:—

1. It has a horse-shoe shaped scar at the base, sometimes called a "sucker mouth" scar, or "spoonbill."
2. Stiff bristles surround this scar but in some cases these are very few or may be broken off.

3. It has a stiff, twisted awn, often bent at right angles.

4. The grain is mostly black, but white and yellow Wild Oats are becoming more common.

These white oats, in some cases, resemble the cultivated oat very closely, and may be a degenerate form of a tame variety. They are called "false" Wild Oats, and generally resemble closely the special variety of white oat amongst which they are found.

WILD OAT SEEDS

1. Characteristic Black Wild Oat, very hairy, with right-angled awn and pronounced spoon bill.

2. Only a few hairs at the lower end and more plump, but other characters the same.

3. Less hairy towards the upper end.

4. With scarcely any hairs on the main grain and none on the bosom oat.

5. A similar bosom oat taken from a wild main oat with none of the ordinary characteristics of the wild variety.

6. A brown, hairless variety with pronounced spoon bill, but is not at all plump.

7. A yellowish variety much like No. 6 except in color.

8. A white grain with no hairs but quite thin, the awn and bill being well marked.

9. A plump white grain, with no ordinary characteristic except the spoon bill.

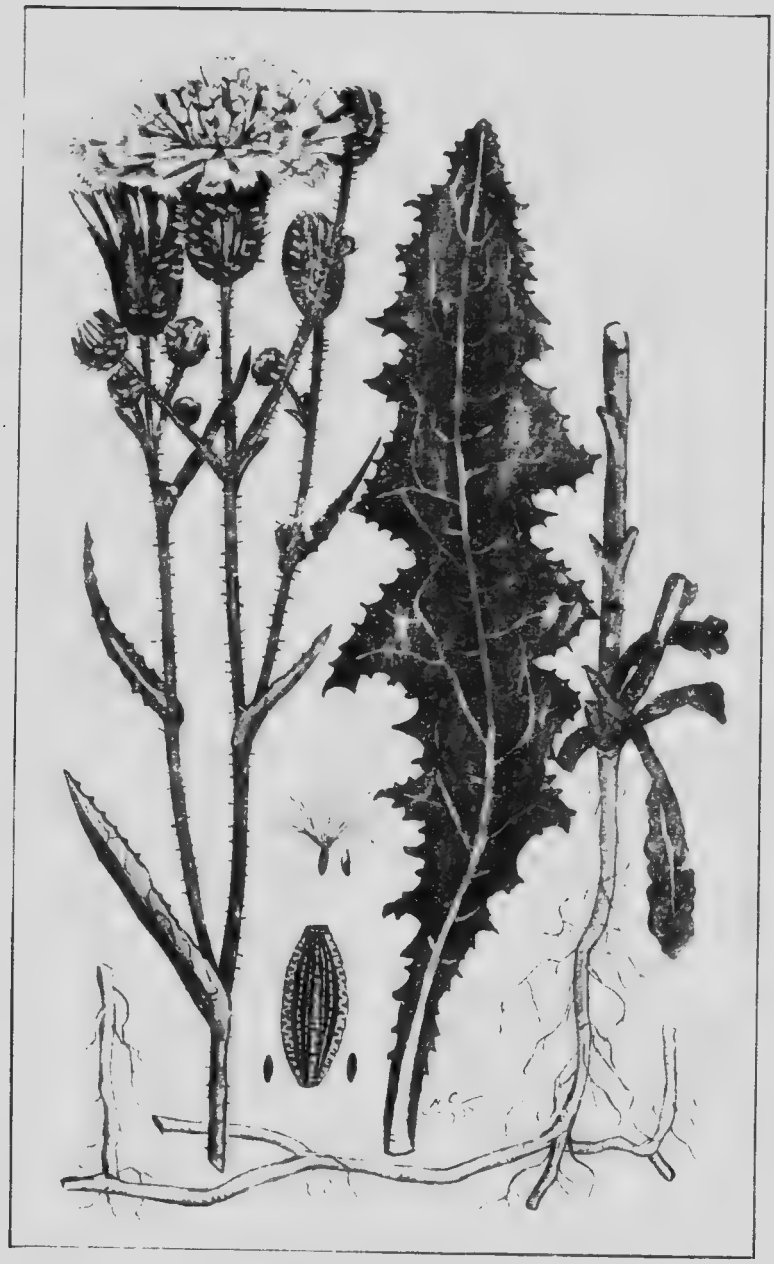
10. A larger and plumper white grain, very closely resembling Abundance oats and presumably a false wild oat.

REMEDIES FOR WILD OATS.

Some of the remedies for this weed are: Clean seed, thorough summer-fallow and a regular crop rotation, which includes at least two or three years in grass. The eradication of this weed is somewhat complicated owing to the fact that very few, if any, of the seeds germinate in the fall, and when they do start, the ordinary spike-tooth harrow is of very little service in uprooting the firmly-established plant. When intending to summer-fallow a field, it should be disc harrowed in the fall; this will bury the weed seeds and encourage them to germinate in early spring. As soon as the surface seeds have all germinated, the land should be plowed and immediately harrowed to retain moisture.

A second crop of weed seeds will then quickly germinate. These can either be destroyed with a cultivator, disc harrow or fed off with stock. The last plan has the advantage on light soil of packing the land and thus retaining the moisture.

Where the land cannot be summer-fallowed, the weeds may be greatly reduced by growing a fodder crop, such as oats or barley, and cutting it before the heads are fully formed. If mown at an early stage, two and sometimes three cuttings of green feed can be secured, and each cutting destroys a number of weeds.



PERENNIAL SOW THISTLE
(*Sonchus arvensis.*)

THE PERENNIAL SOW THISTLE

(Sonchus arvensis L.)

This weed now stands in the same class as the Canada Thistle, and in many parts of Manitoba it is considered the worst noxious weed with which the farmer has to contend. It has gained a foothold in most places before the people recognized the plant, but once the plant is identified it will not likely be overlooked. Unlike Wild Oats, there is no difficulty in knowing Sow Thistle as soon as it appears above the ground.

The first leaves are entire, much longer than wide and slightly prickly. Leaves higher up on the stem are cut and lobed with soft prickles on the margin, the stem also being prickly.

The flower stem shoots up very rapidly when it starts to grow, and soon stands well above the grain crop, sending forth large yellow flowers about the size and looking very much like a Dandelion flower.

The seeds are about one-eighth of an inch long and have a very fine white down, which is a strong factor in the spread of the weed, as they fly about much worse than the Dandelion or even the Canada Thistle. This may be distinguished from Canada Thistle seed by the ridges, both lengthwise and crosswise, the Canada Thistle being smooth.

Like the Canada Thistle, the perennial Sow Thistle has a long, underground, creeping stem, which will produce a new plant every few inches. By spreading in this way it is able to take complete possession of the ground, crowding out the young grain plants before they get a start.

REMEDY.

This weed, in some respects, is more difficult to eradicate than the Canada Thistle. The root stocks spread and the winged seeds scatter just as freely as in the case of the Canada Thistle, and, besides, the seed of this weed is more viable, as nearly every seed will grow.

CANADA THISTLE
(*Cirsium arvense L.*)

Fortunately, however, the seed will germinate at a low temperature in the fall, and it is possible, by covering them with a disc harrow or skim plow, to get a large proportion of the seeds to grow in the fall, when the young seedling plants may be destroyed with a second harrowing either in the late fall or following spring. Where any of the seeds have been allowed to ripen, this plan should be followed.

If, when first introduced, this weed is confined to a few small patches, it can be smothered by covering completely with tar paper. Single scattered plants may be dug out carefully and thus prevented from spreading.

Cross-plowing summer-fallow and late fall plowing, as recommended for Canada Thistle, will also give good results, but the work must be thoroughly done.

CANADA THISTLE

(Cirsium arvense L.)

The Canada Thistle is not a native of this country, having been introduced from Europe, where it is called Creeping Thistle.

It is a perennial with long underground root-stocks, from which grow upright stems from one to three feet in length. The leaves are crimped, curly, smooth on the upper side, white-woolly beneath, and bear a great number of prickles.

The flowers are mostly purple, but vary in shade from purple to pink and creamy white. The heads are of two kinds. One plant bears large, globular heads of male flowers, which produce pollen but no seed. Other plants bear smaller oblong heads of female flowers, which produce all the seed.

The Canada Thistle spreads both by seeds and the extensive root stocks. The seeds have a large pappus or down, which carries them long distances in the air, while the root stocks sometimes extend fifteen to twenty feet from the parent plant.

WILD MUSTARD
(*Brassica arvensis.*)

REMEDY.

This persistent weed cannot be exterminated by mowing alone; its rootstocks extend in all directions, and by cutting off the plant above the surface of the ground we simply prune and stimulate it to more rapid growth.

The only effective means for its eradication is to keep the plant continually cut off below the surface for one season. It then has no opportunity to form leaves and must of necessity die.

A field badly infested with thistles should be plowed late in the fall and left rough, so that the thistle roots are well exposed to the frost, thus killing a large proportion of them. During the following spring and summer the land should be so thoroughly tilled with harrow and cultivator that not a leaf will appear above the surface. If this work is thoroughly done, there will remain very few live plants at the close of the season.

CHARLOCK OR WILD MUSTARD

(Brassica arvensis L.)

This weed was naturalized from Europe, and has been a constant trouble in Eastern Canada for many years. It is an annual, and produces an enormous number of seeds which resemble turnip, rape or cabbage seed, although usually a trifle smaller.

The plant itself grows about two feet high and is quite hairy throughout, the leaves being either entire or the lower ones may have a large lobe at the end and several smaller lobes or leaflets towards the base.

The flowers are bright yellow, about half an inch across, and are followed by pods about two inches long. There is a distinct seedless, two-sided beak at the end of each pod, and the pods are mostly slightly knotted or enlarged where each seed is borne.

Bird Rape is spreading in Manitoba, and is often mistaken for Wild Mustard. It differs in having smooth leaves and stem, the leaves being much like common Rape or small Turnip leaves.

STINKWEED OR FIELD PENNYCRESS
(*Thlaspi arvense*

Wild Radish is also very much [illegible] Wild Mustard. It is now a troublesome weed in North Dakota. The flowers, however, are slightly streaked with purple and rather larger than Mustard or Bird Rape, while the leaves are more completely lobed and quite hairy. The pods, too, are larger and quite distinctly jointed, looking very much like cultivated Radish pods.

REMEDY

The seed of this plant is almost the size of a small grain of wheat, and for this reason great care should be exercised in cleaning seed grain containing it.

Charlock seed germinates readily at a low temperature in the fall. For this reason, land infested with this weed should be lightly plowed or disc harrowed directly after harvest, so as to germinate a large proportion of the seeds before winter, when frost will destroy the young seedlings. Early in spring the land should be again worked up with the plow and harrow so as to encourage all the seeds near the surface to sprout before the grain is sown. The land may be harrowed directly after sowing the grain and again as soon as it is above the surface.

A thorough summer-fallow will usually prove very effective in reducing the number of seeds in the soil. To prove effective in Western Canada a summer-fallow must be plowed as early as possible to get the weed seeds lying near the surface to germinate, say, not later than July 1st. Each day's plowing should be harrowed before night so as to retain the soil moisture. Unless perennial weeds are troublesome, it is not advisable to plow a second time, but shallow cultivation should be continued throughout the season to stimulate the growth of weeds and to destroy the seedling plants.

FRENCH OR STINK WEED

(Thlaspi arvense L.)

French Weed, sometimes called Penny [illegible] as originally introduced from Europe, and it is rapi[illegible] reading over Western Canada.

COUCH GRASS
(*Agropyron repens.*)

It is an annual or winter annual, and the plants that remain green over winter flower shortly after the snow disappears, and seeds are thus being ripened throughout the whole summer.

The small white flowers are only about an eighth of an inch across, but the flat seed pods are very conspicuous, being about the size of a five-cent piece and having a distinct notch at the top. The outer circle of this pod consists of a kind of wing, while the inner circle contains two rows of six or eight seeds each.

Although the plant usually grows one and one-half to two feet high, it will often be found producing seed while only two inches above the ground. Under good conditions it produces a rank growth of leaves and has a most unpleasant smell, somewhat resembling garlic. When eaten by milk cows it imparts a disagreeable flavor to the milk.

REMEDY.

Sow clean seed. Being a winter annual, the young plants are perfectly hardy; therefore, they require a somewhat different treatment from the ordinary Mustard.

Land infested with this weed should be plowed and harrowed as soon as the crop is harvested. When the weed seeds have germinated in spring, the land should be cultivated and harrowed so as to destroy the young plants when at a tender age.

As soon as the grain is above the surface, and before the leaves have their second pair of leaves, a weeder or light harrow should be used to destroy all weeds coming up among the grain. If this is done promptly, the crop will then be strong enough to smother out any fresh weeds that may start.

COUCH OR QUACK GRASS

(Agropyron repens L.)

Couch Grass is a perennial, and in addition to producing seeds it spreads by long, branching, shallow rootstocks.

GREAT RAGWEED
(*Ambrosia trifida.*)

It is sometimes called Twitch Grass, Quack Grass or Scutch Grass, and it is undoubtedly the worst of the noxious wild grasses. It is rather difficult to know Couch Grass in its young stage, but after it has headed out it may be recognized by its peculiar spike or head in which the small spikelets will be found with their flat side facing the stem. The leaves are dark green, rather distinctly veined and slightly hairy below.

Once this weed is established, it is easily known by the large matted beds which it forms, and in which nothing else is able to grow. The long, branching, jointed rootstocks send up a new plant from each joint, which helps the plant to spread rapidly.

REMEDY.

Plow shallow during the warm dry weather of midsummer and cultivate thoroughly with harrow and spring-toothed cultivator so as to bring the roots to the surface, then rake up and burn them. In some cases where the sod is very thick and tough it will be found necessary to cross-plow the field before all the roots can be brought to the surface.

Another remedy is to sow heavily with barley not later than June 1st. The seeding must follow closely after the plowing, so as to get a rapid germination and heavy growth, and thus choke out the Couch.

GREAT RAGWEED

(Ambrosia trifida L.)

This weed is sometimes called Giant Ragweed, King Head, Crown Weed or Crowfoot. The first name arises from the size of the plant, which grows as high as four or five feet; the next two names refer to the shape of the seed, which is about one-quarter of an inch long and has a tapering top, around which are six or eight blunt spines, thus giving the whole seed the appearance of a crown; the name Crowfoot refers to the division of the leaves into three or five parts, thus resembling a crow's foot.

BALL MUSTARD

(*Neslia paniculata*)

It is not very easy to know this plant when quite young, but later the divided or lobed leaves generally give it a characteristic appearance. The flowers are borne on long spikes at the top and are very small and yellow, the upper ones being male flowers while the female flowers and seeds are produced in the axils of the upper leaves. The flower top looks like a rat's tail.

Although Great Ragweed crowds out and starves the growing crop, the chief injury comes from the presence of the seeds in the threshed grain. It is so difficult to separate from wheat that millers either refuse to buy altogether or place a very heavy dockage on it.

False Ragweed, or Marsh Elder, is often mistaken for Great Ragweed. It grows mostly around buildings and waste places and does not cause much trouble in the crops. It has very large velvety leaves, with scarcely any deep lobes, and the whole plant grows stronger and generally higher than the Great Ragweed. The seed is grayish-black and about the size of a pin-head.

REMEDY.

This large, coarse weed is very conspicuous among grain, and if there are only a few scattered plants they can readily be seen and pulled by hand.

In the Red River Valley the seeds are largely distributed by water; therefore, the banks of all ditches, the road sides and waste places should be kept free of this weed by mowing early in the season. Where the plants are numerous, early fall discing and harrowing after the crop is up will greatly help to check this weed. Summer-fallowing, properly worked, is also useful for this purpose.

BALL MUSTARD

(Neslia paniculata L.)

Ball Mustard is an annual, and in some districts in Manitoba it is *the* Mustard, from a weed standpoint. It is also very troublesome in some parts of Alberta.

FALSE FLAX
(Camelina sativa.)

When young, Ball Mustard looks quite like False Flax, but it soon sends up numerous flowering branches from the upper part of the slender stem. These bear small yellow flowers, which are followed by the small round pods. The little pods are about the size of a large pin-head and each contains one seed. The seed is of a light yellow color, but the pods rarely break open. Hence the seed, as found in grain, will appear as small roundish veiny balls, which give the name to the plant.

REMEDY.

Sow clean seed. This seed, whether in the pod or threshed, is readily separated from all kinds of grain, and there should be no excuse for sowing it with them. It is more difficult to separate the threshed seed from flax, and without doubt it was first introduced into Western Canada by this means.

Where the plants are few, they can be quickly seen and pulled by hand. When they are numerous, the land should be disced or skim plowed early in the fall and then summer-fallowed the following season.

If it is absolutely necessary to sow a crop on an infested field, it should be harrowed directly after sowing and again when the crop is above the ground.

A regular rotation, including at least two or three years in grass, will greatly tend to keep this weed in check. All fence corners, vacant corrals and unused yards should be kept free from this weed by mowing.

FALSE FLAX

Camelina sativa L.

False [illegible] is an annual, [illegible] sometimes a winter annual. The leaves of the young plant somewhat resemble those of French Weed, and generally have no leaves which appear to clasp the stem.

DARNEL

(Lolium temulentum)

There are three distinct species of False Flax now growing as weeds in Manitoba. All may be readily known from their characteristic pear-shaped pod, which is about the size of a pea. The size and shape of the pod helps to distinguish the three species. The small seeded False Flax (*Camelina microcarpa*) has a smaller pod than the common False Flax (*Camelina sativa*), while the pod of the round-seeded False Flax is much more globular and quite flattened at the top.

False Flax was introduced from Europe. In France and Germany it is cultivated for the seed, which contains considerable mucilage and oil, both of which tend to favor the persistence of the plant as a weed, since they help to preserve the seed.

REMEDY.

Sow clean seed. There are three distinct forms of the seed of this plant, and all may be readily separated from wheat and coarse grains, but it is a more difficult operation with flax, for the seeds are nearly the same shape, size and weight. This is particularly true of the round-seeded False Flax (*Camelina dentata*), which has very much the same shaped seed and is often mistaken for hulled flax. The plants of this weed are usually large and readily seen, and where few and scattered they may be pulled by hand.

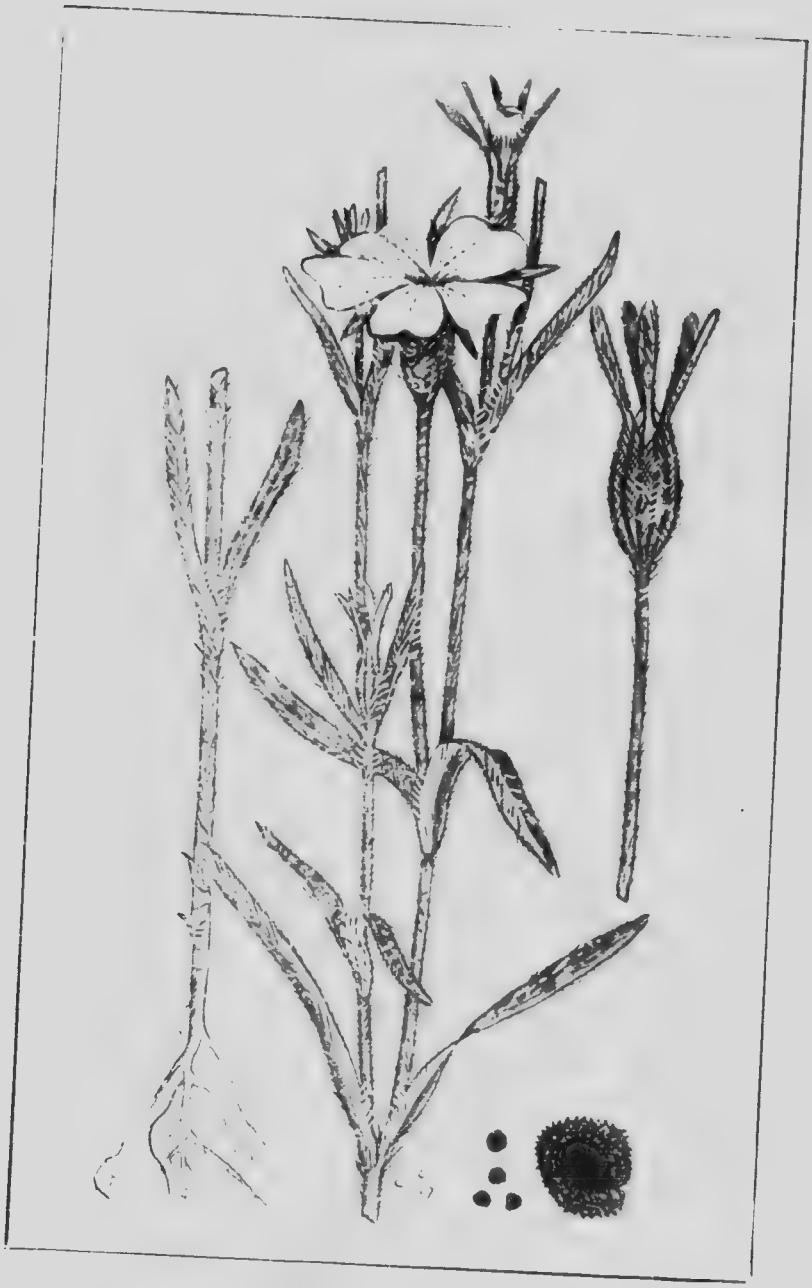
Like all other members of the Mustard family, the young plants are easily destroyed with a weeder or light harrow after the grain is up.

Summer-fallow and skim plowing in the fall are also efficient means of destroying the seeds.

DARNEL

(Lolium temulentum L.)

Darnel is a comparatively new weed in Manitoba. It stands in the same class as Wild Oats and Chess in the matter of difficulty in distinguishing the plant from that of the wheat or oat. It grows at about the same rate and to almost the same height as these grains.



PURPLE COCKLE
(*Agrostemma Githago*)

It may be recognized as soon as it heads out from the appearance of the head, which resembles that of Couch Grass, but differs in having the edge of each little spikelet facing the stem instead of being broadside as in Couch Grass.

Darnel is an annual, spreading by seeds only. It appears to be able to grow under most adverse conditions, and for this reason it bids fair to become a most troublesome weed if it is not kept in check.

REMEDY.

Sow clean seed. The seed of this plant greatly resembles a small kernel of barley, and is very apt to be overlooked by the average farmer.

It is much lighter than wheat and may readily be blown out of this grain with the fanning mill or floated off when the wheat is being treated for smut.

A regular rotation, which includes two or three years of grass, will greatly reduce this pest. Surface cultivation after harvest is also of great assistance, as it covers the seed and hastens germination in the spring, thus giving an opportunity to destroy the young plants before the grain is sown.

PURPLE COCKLE

(Agrostemma githago L.)

Purple Cockle, called Corn Cockle in England, is an annual or sometimes lives over winter as a winter annual. It grows from two to three feet high and branches out loosely. The branches and flower calyx are covered with long whitish hairs, and these are not sticky as in Night-flowering Catchfly, which for this reason is called Sticky Cockle. The Sticky Cockle, however, has a creamy white flower which easily distinguishes it from the purple-flowered variety. The five long hairy teeth of the calyx cup of the Purple Cockle is very noticeable, as they remain surrounding the pod even after it is ripe.

The seeds are roundish, rough, triangular-shaped, about the size of wheat and jet black.

WILD PEPPER GRASS

(*Lepidium apetalum Willd*)

The chief injury of this weed arises from the objectionable growth in the crops, and the seeds also spoil the grade of flour. There is a poisonous element in it which makes the flour unwholesome, and chickens sometimes die from eating Cockle seeds.

Cow Cockle (*Saponaria vaccaria L.*) is also making headway in Manitoba. This plant has smooth leaves and the flowers are pale pink and much smaller than Purple Cockle. The seeds are quite round, dull black and look somewhat like vetch seed.

REMEDY.

Sow clean seed. It is extremely difficult to separate the seed of this plant from wheat. It can only be done with the common fanning mill by running a considerable quantity of the wheat over the sieves, but it pays to do this where the wheat is for seed purposes.

The weed is not very generally distributed in Western Canada, and usually only an occasional plant is found among the crop. These should be pulled by hand. Its bright purple flower and striking foliage make it readily distinguished from other plants. In the few cases where the weed has been very prevalent, an early plowed summer-fallow will prove the best remedy. Discing the stubble in the fall and harrowing after the crop is up will also help to check it.

REMEDY FOR COW COCKLE.

The same general treatment as given for Purple Cockle. As the seed is somewhat smaller, it is not so difficult to clean from wheat.

PEPPER GRASS

(Lepidium apetalum Willd.)

Pepper Grass is a native of Canada. It is an annual or winter annual and is quite troublesome in some parts. The young plants look quite like Shepherd's Purse and the little green rosettes of leaves of the winter annual species are quite noticeable in the early spring. As the plant grows it sends out a great many somewhat horizontal branches, which give it the

bushy appearance of a little tree. On these branches are borne an enormous number of little pods, the same shape as those of French Weed but only about the size of an average pin-head. The pods appear to spring out without flowers—these being so small that they are not easily seen.

The pods continue to ripen throughout a considerable part of the summer, and although there are only two seeds in each pod, yet the production of seeds amounts to about 18,000 on an average plant.

Pepper Grass, when allowed to flourish amongst grain, will reduce the yield of the crop by one-half, due to the crowding of the bushy tops and the absorption of moisture required for its growth.

REMEDY.

There are two ways by which this weed may become very plentiful and troublesome. Through immature plants living over winter, and, second, by plants grown from seed brought near the surface by late plowing of summer fallow. The remedy for the first is to cultivate the ground with the broad-toothed cultivator late in the fall or early in the spring. The second may be prevented by plowing the summer-fallow only once, early in the season, and giving shallow cultivation during the remainder of the summer.

We are indebted to Mr. Geo. H. Clark, Seed Commissioner, Ottawa, and Mr. Norman Criddle, of Treesbank, Manitoba, for assistance in supplying most of the cuts presented in this bulletin.

Copies of the bulletin may be obtained free by writing the Principal of the Agricultural College, Winnipeg, Manitoba.